ARIZONA DEPARTMENT OF TRANSPORTATION * MATERIALS GROUP

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POLICY AND PROCEDURE DIRECTIVE

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TO: ALL MANUAL HOLDERS	PPD NO. 96-6
SUBJECT: ASPHALTIC CONCRETE MIX DESIGN PROPOSALS AND SUBMITTALS	EFFECTIVE DATE: March 1, 1996

GENERAL

This Policy and Procedure Directive supersedes P.P.D. No. 90-1.

The following information is provided to assist those involved in the preparation and submittal of asphaltic concrete mix design proposals in accordance with the requirements of the Specifications.

Metric (SI) units and values are given in this Policy and Procedure Directive with English units and values following in parentheses. Values given for metric and English units may be numerically equivalent (soft converted) for the associated units, or they may be given as rounded or rationalized values (hard converted). Either the metric or English units along with their corresponding values shall be used in accordance with applicable specifications.

REQUIREMENTS FOR MIX DESIGN LABORATORIES

To insure that testing laboratories are capable of performing all asphaltic concrete mix design testing in conformance with the appropriate test procedures, laboratories wishing to perform asphaltic concrete mix design testing must have had an equipment and procedural inspection by Department personnel to demonstrate mix design testing. Any deficiencies found shall be corrected before mix designs will be accepted. Arrangements for laboratory inspections may be made by contacting the Materials Section Quality Assurance Engineer.

Mix design laboratories must satisfy the requirements of the Arizona Department of Transportation "System for the Evaluation of Testing Laboratories".

REQUIREMENTS FOR REGISTRANT

The Specifications require that asphaltic concrete mix designs be prepared under the direct supervision of a professional engineer, registered in the state of Arizona, experienced in the development of asphaltic concrete mix designs and mix design testing. The following items should help clarify our policy relative to this subject.

1) Mix designs shall be stamped, signed, and dated by the engineer responsible for the mix design.

2) The policy does not preclude the use of consultant engineers, provided the consulting engineer supervises the testing and mix design development, has evaluated the test equipment and procedures used in the laboratory and found them in compliance with all test method requirements, and is thoroughly knowledgeable in asphaltic concrete mix design preparation.

3) The use of a registrant who is not experienced in the development of asphaltic concrete mix designs and mix design testing is clearly prohibited. While experience by the registrant in preparation of asphaltic concrete mix designs in accordance with Arizona Test Methods is preferred, experience in mix design preparation under comparable procedures may be substituted if the registrant demonstrates that he/she is fully aware of the Arizona procedures and is prepared to conform to them.

4) Submission of a mix design which does not comply with test method requirements will be considered cause for rejection of that mix design. Should such a failure be of a significant or reoccurring nature, the Department may refuse to accept mix design proposals from that registrant.

5) The use of the term "direct supervision" is interpreted to include the requirement that the registrant be physically present on a routine basis while the mix design testing is being done and is in responsible charge of that work.

6) All laboratories that wish to submit asphaltic concrete mix designs must submit information to the Materials Group Bituminous Engineer, which indicates that the requirements described above have been met. This information must be provided prior to submitting asphaltic concrete mix designs. Information provided should include evidence of registration and experience in asphaltic concrete mix designs and mix design testing. Also included should be information which outlines how the requirement for providing direct supervision is to be satisfied.

REQUIRED MIX DESIGN SUMMARY ITEMS

Asphaltic concrete mix designs are being submitted in a variety of different formats, which in some cases has caused difficulty in locating the required mix design information. To accomplish better uniformity this policy requires that mix designs have a one to two page summary which contains the information shown below.

1) Project Number and "TRACS" Number.

2) Prime Contractor.

3) Type of Mix Design. If the same mix design is developed to satisfy the requirements for more than one type of mix, 12 mm AC (1/2" AC) and 19 mm AC (3/4" AC) for example, the mix design shall clearly state this, and also show the specifications governing for each individual type of mix.

4) Name and address of testing laboratory which developed the mix design.

5) Date of mix design. The date the mix design is signed by the engineer, as shown on his registration stamp, will be the mix design date. Revised mix designs shall be submitted containing all information for the design. Revised mix designs shall be identified as such, and shall be stamped, signed, and dated by the responsible engineer.

6) Name and Signature of professional engineer who is responsible for the mix design.

7) Specific location(s) of original source(s) of mineral aggregate.

8) Composite percentages and gradation of mineral aggregate along with appropriate mix design grading bands. The mix design composite gradation of the mineral aggregate material shall be the gradation of the washed aggregates in accordance with the requirements of Arizona Test Method 201.

9) Source, type, percentage, and specific gravity of mineral admixture, when used. The mix design shall be developed by, and so state, laboratory mixing procedures which simulate the method of adding mineral admixture which will be used in the production of the asphaltic concrete.

10) When a mix design is performed with mineral admixture, the percent of admixture, by specification, is by weight of the mineral aggregate. The composite gradation of the mineral aggregate and mineral admixture, in accordance with Arizona Test Method 815, with appropriate mix design grading bands are to be shown in the mix design proposal.

11) Supplier, refinery, type, percentage, and specific gravity of asphalt cement.

12) Abrasion for each source of mineral aggregate used.

13) Sand equivalent for combined mineral aggregate.

14) Crushed faces of mineral aggregate.

15) Aggregate coarse and fine specific gravities, and combined aggregate specific gravities and water absorption. In some cases, the calculation of combined water absorption has been done incorrectly. The proper method of calculation is given in Arizona Test Method 815.

16) Asphalt absorption.

17) Recommended mix design asphalt content.

18) The following mix design characteristics at the recommended asphalt content shall be given: percent air voids, V.M.A., bulk density, Marshall stability and flow, Immersion Compression results (wet strength, dry strength, and index of retained strength), and the calculated maximum density of bituminous mixture.

19) The ratio of effective asphalt content to the mix design composite gradation target for the 75 micrometer (No. 200) sieve, including admixture when used.

20) Any stipulations upon which the use of the mix design is contingent. (Minimum or maximum percentage of special materials such as washed or imported aggregates.)

ADDITIONAL MIX DESIGN REQUIREMENTS

In addition to the mix design summary, worksheets showing laboratory data and test results are also to be included in the mix design. The loading used in the preparation of immersion compression specimens is to be reported as part of the test data. The gradation of individual mineral aggregates used is required to be reported in the mix design.

Designs formulated with bin and stockpile material must be developed as described in Arizona Test Method 815, utilizing Arizona Test Method 244 to artificially grade the stockpile material to the bin composite. The mix design shall clearly state that this procedure has been followed and worksheets supplied with artificial grading information and calculations. The mix design must contain the percentage of each stockpile which is used to feed the bins.

If any tests shown in the mix design were performed by another testing lab, the mix design should clearly state the tests, where they were performed, and the registrant under whose direction the testing was accomplished. The laboratory performing this mix design testing and the registrant must meet the requirements of this Policy and Procedure Directive.

If the Regional Materials Laboratory has implemented a system of Product Code Numbers for commercial sources to identify Producers, Plants, and Mix Types, this code number shall be given on the mix design. If a code number for commercial sources is not utilized, as a minimum the producer and plant number must be shown.

Mix design proposals for end-product asphaltic concrete are submitted to the Engineer, along with representative samples of the mineral aggregate used in the mix design for determination of sand equivalent, and uncompacted void content if required.

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Approved by: _____
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